REMARKS

This paper is responsive to a Final Office Action dated July 22, 2004. The drawings are objected to because the page indicators do not correctly reflect the number of sheets of drawings. Claims 1-28 were examined. Claims 1-4, 7, 9-10, 13-17, 19, and 27 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,272,171 to Okunev et al. Claims 1, 13, 20, 25, and 27 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,661,847 to Davis et al. Claims 5-6, 8, 11-12, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okunev in view of Davis. Claims 20-23, 25-26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okunev in view of U.S. Patent No. 6,301,296 to Krishnan et al. Claim 24 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Okunev in view of Krishnan and further in view of Davis.

Objections to the Drawings

New sheets of drawings are submitted to correctly reflect the number of drawing sheets. No new matter is added.

Rejections under 35 U.S.C. § 102

Claims 1-4, 7, 9-10, 13-17, 19, and 27 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Okunev. Regarding claim 1, Applicant respectfully maintains that Okunev, alone or in combination with other references of record, fails to teach or suggest

> assigning constellation points for a constellation index based on one or more characteristic sets corresponding thereto, wherein the one or more characteristic sets include contributions of symbol estimates from phase intervals associated with one or more other constellation indices,

as recited by claim 1. The Office Action mailed July 22, 2004 (hereinafter, the Final Office Action) relies on FIG. 1b and FIGS. 8a-8c of Okunev, to supply this teaching. The Final Office action states that Okunev's "constellation design is optimized per frame: column 6 lines 17-lines

33." These portions of Okunev teach a power optimization technique that allows individual slots to exceed power limitations as long as an average power limitation of the frame is not exceeded. (Col. 6, lines 17-33) Okunev assigns constellation points based on these power limitations. The power of individual slots of Okunev are based upon the translation tables, which are based upon scaling factors. Okunev teaches computing a set of candidate scaling factors for each slot subject to robbed bit signaling (col. 8, lines 18-53) and optimizing distances between constellation points independently for each slot (see also FIG. 1b, and FIGS. 8a-8c, and col. 18, line 34-col. 22, line 67 of Okunev). Assuming arguendo that Okunev's translation tables are similar to the characteristic sets of symbol estimates of claim 1, nowhere does Okunev teach that the scaling factors or translation tables include contributions of symbol estimates from phase intervals associated with one or more other constellation indices. Thus, Okunev's assignment of constellation points based upon average frame power limitations fails to teach or suggest assigning constellation points based upon a characteristic set of symbol estimates for phase intervals including contributions of symbol estimates from phase intervals associated with one or more other constellation indices, as required by claim 1. For at least this reason, Applicant maintains that claim 1 distinguishes over Okunev, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 1 and all claims dependent thereon, be withdrawn.

Regarding claim 13, Applicant respectfully maintains that Okunev fails to teach or suggest

> for each of the J constellation indices, selecting constellation points based on the characteristic groups associated with the one or more respective phases,

as recited by claim 13. The Final Office Action states that "constellation points selection is optimized per frame: column 6, lines 17-lines 33 wherein constellation points selection is based on the characteristic groups (the signal level and distance are two characteristics column 3 lines 1-5) associated with the one or more respective phases." However, the characteristic groups of claim 13 are determined by

> grouping N phases into a set of characteristic groups according to aggregate effects of the periodic impairments, if any, present in the N phases and without a priori identification of individual forms of the periodic impairments present therein.

Okunev teaches optimizing distances between constellation points based on signal level and distance, but the optimization is performed independently for each slot. (FIG. 1b, and FIGS. 8a-8c, and col. 18, line 34-col. 22, line 67) Nowhere does Okunev teach or suggest selecting constellation points based on characteristic groups associated with one or more respective phases, as required by claim 13. For at least this reason, Applicant maintains that claim 13 distinguishes over Okunev, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 13 and all claims dependent thereon, be withdrawn.

Regarding claim 27, Applicant respectfully maintains that Okunev fails to teach or suggest

> said instructions including an impairment compensation subset thereof executable to group N phases of a symbol sequence received by the communications device into a set of characteristic groups according to correspondence of aggregate effects of periodic impairments, if any, present in the N phases, the impairment compensation subset of instructions selecting constellation points using symbol estimates characteristic of the grouped phases,

as recited by claim 27. The Final Office Action states that "constellation points selection is optimized per frame: column 6, lines 17-lines 33 wherein constellation points selection is based on the characteristic groups (the signal level and distance are two characteristics column 3 lines 1-5) associated with the one or more respective phases." However, the characteristic groups of claim 13 are determined by grouping N phases of a symbol sequence into a set of characteristic

groups according to correspondence of aggregate effects of the periodic impairments, if any, present in the N phases. Okunev teaches optimizing distances between constellation points based on signal level and distance, but the optimization is performed independently for each slot. (FIG. 1b, and FIGS. 8a-8c, and col. 18, line 34-col. 22, line 67) Nowhere does Okunev teach or suggest selecting constellation points based on characteristic groups associated with one or more respective phases, as required by claim 27. For at least this reason, Applicant maintains that claim 27 distinguishes over Okunev, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 27 and all claims dependent thereon, be withdrawn.

Claims 1, 13, 20, 25, and 27 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,661,847 to Davis et al. Regarding claim 1, Applicant respectfully maintains that Okunev, alone or in combination with other references of record, fails to teach or suggest

> grouping phase intervals into groups based on similarity of aggregate impairment exhibited therein and calculating a characteristic set of symbol estimates for each such group,

as recited in claim 1. The Office Action relies on FIG. 3, col. 6. lines 30-40, col. 6, line 65-col. 7, line 2, col. 7, lines 10-20, lines 41-46 to supply this teaching. These portions of Davis teach encoding blocks of K bits into a sequence of 6 indices through a modulus encoding technique. (Col. 6. lines 30-32). The modulus encoding of Davis is not based on similarities of aggregate impairments, as required by claim 1. The constellation generation method of Davis selects indices of the sequence and determines pad attenuation and, for each of the 6 intervals, an RBS parameter. The parameters of Davis are used to obtain voltage levels for 128 ucodes, which represent the 128 nonnegative voltage levels specified by the ITU-T Recommendation G.711. (Col. 7, lines 11-21) The 128 voltage levels of Davis are used to generate the constellation. (Col. 7, lines 19-21, lines 41-46) Davis generates a voltage level for all of the specified ucodes. Nowhere does Davis teach or suggest grouping phase intervals based on similarity of aggregate impairments exhibited in the phase intervals and assigning constellation points based on these groups. For at least this reason, Applicant submits that claim 1 distinguishes over Davis, alone

or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 1 and all claims dependent thereon, be withdrawn.

Regarding claim 13, Applicant respectfully maintains that Davis fails to teach or suggest

> grouping the N phases into a set of characteristic groups according to aggregate effects of the periodic impairments, if any, present in the N phases and without a priori identification of individual forms of the periodic impairments present therein,

as recited by claim 13. Davis teaches encoding blocks of K bits into a sequence of 6 indices through a modulus encoding technique. (Col. 6. lines 30-32). The modulus encoding of Davis is not based on similarities of aggregate impairments, as required by claim 13. The constellation generation method of Davis selects indices of the sequence and determines pad attenuation and for each of the 6 intervals, an RBS parameter. The parameters of Davis are used to obtain voltage levels for 128 ucodes, which represent the 128 nonnegative voltage levels specified by the ITU-T Recommendation G.711. (Col. 7, lines 11-21) The Final Office Action states that "[t]he extrapolated voltage levels are the aggregated effects of the periodic impairments." Assuming arguendo that the extrapolated voltage levels are similar to the claimed aggregated effects of the periodic impairments, Davis fails to teach or suggest grouping N phases into characteristic groups according to aggregate effects of periodic impairments, as required by claim 13. For at least this reason, Applicant maintains that claim 13 distinguishes over Davis, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 13 and all claims dependent thereon, be withdrawn.

Regarding claim 20, Applicant respectfully maintains that Davis fails to teach or suggest

> an impairment compensator coupled into the receive path during a training mode to receive the sequence and group the N phases thereof into a set of characteristic groups according to aggregate effects of the periodic impairments, if any,

as recited in claim 20. Davis teaches encoding blocks of K bits into a sequence of 6 indices through a modulus encoding technique. (Col. 6. lines 30-32). The modulus encoding of Davis is not based on similarities of aggregate impairments, as required by claim 20. The constellation generation method of Davis selects indices of the sequence and determines pad attenuation and for each of the 6 intervals, an RBS parameter. The parameters of Davis are used to obtain voltage levels for 128 ucodes, which represent the 128 nonnegative voltage levels specified by the ITU-T Recommendation G.711. (Col. 7, lines 11-21) The Final Office Action states that "[t]he extrapolated voltage levels are the aggregated effects of the periodic impairments." Assuming arguendo that the extrapolated voltage levels of Davis are similar to the claimed aggregated effects of the periodic impairments, Davis fails to teach or suggest grouping N phases into characteristic groups according to aggregate effects of periodic impairments, as required by claim 20. For at least this reason, Applicant submits that claim 20 distinguishes over Davis, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 20 and all claims dependent thereon, be withdrawn.

Regarding claim 25, Applicant respectfully maintains that Davis fails to teach or suggest

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means for selecting constellation points using symbol
estimates characteristic of grouped phases,
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as recited in claim 25. Davis teaches encoding blocks of K bits into a sequence of 6 indices through a modulus encoding technique. (Col. 6. lines 30-32). The modulus encoding of Davis is not based on similarities of aggregate impairments, as required by claim 25. The constellation generation method of Davis selects indices of the sequence and determines pad attenuation and for each of the 6 intervals, an RBS parameter. The parameters of Davis are used to obtain voltage levels for 128 ucodes, which represent the 128 nonnegative voltage levels specified by the ITU-T Recommendation G.711. (Col. 7, lines 11-21) The Final Office Action states that "[t]he extrapolated voltage levels are the aggregated effects of the periodic impairments." Assuming arguendo that the extrapolated voltage levels of Davis are similar to the claimed aggregated effects of the periodic impairments, Davis fails to teach or suggest grouping N phases into characteristic groups according to aggregate effects of periodic impairments, as required by claim 25. For at least this reason, Applicant submits that claim 25 distinguishes over Davis,

alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 25 and all claims dependent thereon, be withdrawn.

Regarding claim 27, Applicant respectfully maintains that Davis fails to teach or suggest

> said instructions including an impairment compensation subset thereof executable to group N phases of a symbol sequence received by the communications device into a set of characteristic groups according to correspondence of aggregate effects of periodic impairments, if any, present in the N phases, the impairment compensation subset of instructions selecting constellation points using symbol estimates characteristic of the grouped phases,

as recited in claim 27. Davis teaches encoding blocks of K bits into a sequence of 6 indices through a modulus encoding technique. (Col. 6. lines 30-32). The modulus encoding of Davis is not based on similarities of aggregate impairments, as required by claim 27. The constellation generation method of Davis selects indices of the sequence and determines pad attenuation and for each of the 6 intervals, an RBS parameter. The parameters of Davis are used to obtain voltage levels for 128 ucodes, which represent the 128 nonnegative voltage levels specified by the ITU-T Recommendation G.711. (Col. 7, lines 11-21) The Final Office Action states that "[t]he extrapolated voltage levels are the aggregated effects of the periodic impairments." Assuming arguendo that the extrapolated voltage levels of Davis are similar to the claimed aggregated effects of the periodic impairments, Davis fails to teach or suggest grouping N phases into characteristic groups according to aggregate effects of periodic impairments, as required by claim 27. For at least this reason, Applicant submits that claim 27 distinguishes over Davis, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 27 and all claims dependent thereon, be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 5-6, 8, 11-12, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okunev in view of Davis. Applicant believes that claims 5-6, 8, 11-12, and 18

depend from allowable claims, and that these claims are allowable for at least this reason. Accordingly, Applicant respectfully requests that the rejection of claims 5-6, 8, 11-12, and 18 be withdrawn.

Claims 20-23, 25-26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okunev in view of Krishnan et al. Regarding claim 20, Applicants respectfully maintain that Okunev fails to teach or suggest

> the impairment compensator selecting, for each of J constellation indices, constellation points based on the characteristic groups associated with the respective phase intervals corresponding thereto,

as recited in claim 20. The Final Office Action relies on the translation table design steps 100a and 100b of FIG. 1a-2 to teach grouping based on aggregate effects of periodic impairments. Okunev teaches determining the number of slots subject to RBS (col. 8, lines 18-20) and generating a set of candidate scaling factors for the slots accordingly. Okunev teaches a power optimization technique that allows individual slots to exceed power limitations, so long as an average power limitation of the frame is not exceeded. (Col. 6, lines 17-33) Okunev assigns constellation points based on these power limitations. Okunev fails to teach or suggest selecting constellation points based on characteristic groups associated with respective phase intervals, the grouping of phases into characteristic groups being based on aggregate effects of periodic impairments, as required by claim 20. Krishnan teaches a DIL sequence designed to provide a reliable estimate of digital impairments. (Abstract) Krishnan fails to teach or suggest selecting constellation points based on characteristic groups associated with respective phase intervals, the grouping of phases into characteristic groups being based on aggregate effects of periodic impairments, as required by claim 20. For at least this reason, Applicants maintain that claim 20 distinguishes over Okunev, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 20 and all claims dependent thereon, be withdrawn.

Regarding claim 25, Applicants respectfully maintain that Okunev fails to teach or suggest

means for selecting constellation points using symbol estimates characteristic of grouped phases,

as recited in claim 25. The Final Office Action relies on the translation table design steps 100a and 100b of FIG. 1a-2 of Okunev to teach grouping based on aggregate effects of periodic impairments. Okunev teaches determining the number of slots subject to RBS (col. 8, lines 18-20) and generating a set of candidate scaling factors for the slots accordingly. Okunev teaches a power optimization technique that allows individual slots to exceed power limitations, so long as an average power limitation of the frame is not exceeded. (Col. 6, lines 17-33) Okunev assigns constellation points based on these power limitations. Okunev fails to teach or suggest selecting constellation points using symbol estimates characteristic of grouped phases, as required by claim 25. Krishnan teaches a DIL sequence designed to provide a reliable estimate of digital impairments. (Abstract) Krishnan fails to teach or suggest selecting constellation points based on characteristic groups associated with respective phase intervals, the grouping of phases into characteristic groups being based on aggregate effects of periodic impairments, as required by claim 25. For at least this reason, Applicants maintain that claim 25 distinguishes over Okunev, alone or in combination with other references of record. Accordingly, Applicant respectfully requests that the rejection of claim 25 and all claims dependent thereon, be withdrawn.

Claim 24 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Okunev in view of Krishnan and further in view of Davis. Applicant believes that claim 24 depends from an allowable claim and that this claim is allowable for at least this reason. Accordingly, Applicant respectfully requests that the rejection of claim 24 be withdrawn.

In summary, claims 1-28 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

CERTIFICATE OF MAILING OR TRANSMISSION

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Date

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Respectfully submitted,

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AMENDMENTS TO THE DRAWINGS

The attached sheet(s) of drawings include changes to Sheets 1-6 and replace the original sheet(s) including such figures.

Attachment(s): Replacement Sheets 1-6; and
Annotated Sheets Showing Changes to Sheets 1-6.

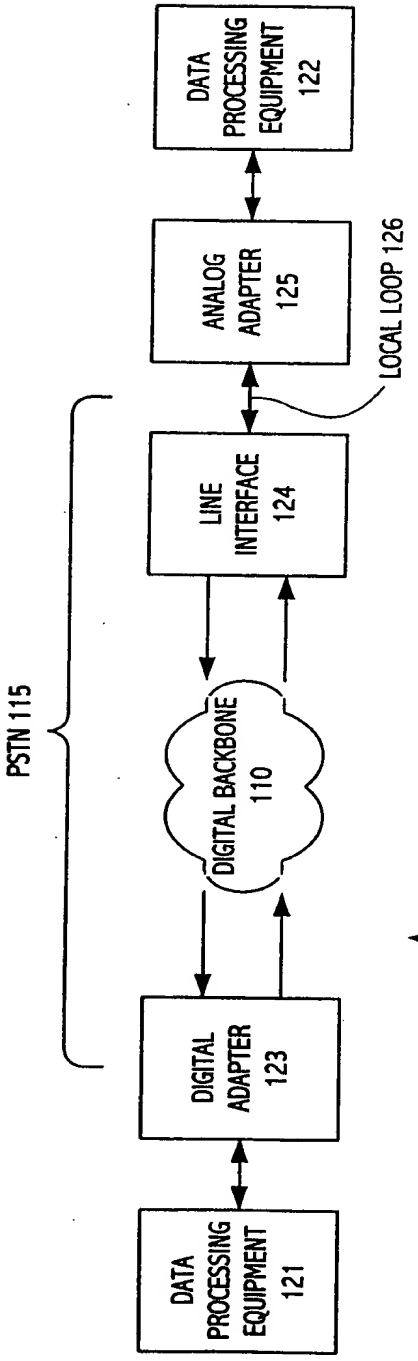

FIG. 1 (PRIOR ART)

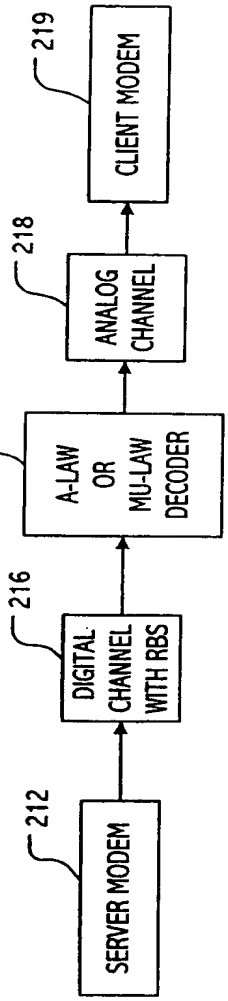

FIG. 2 (PRIOR ART)

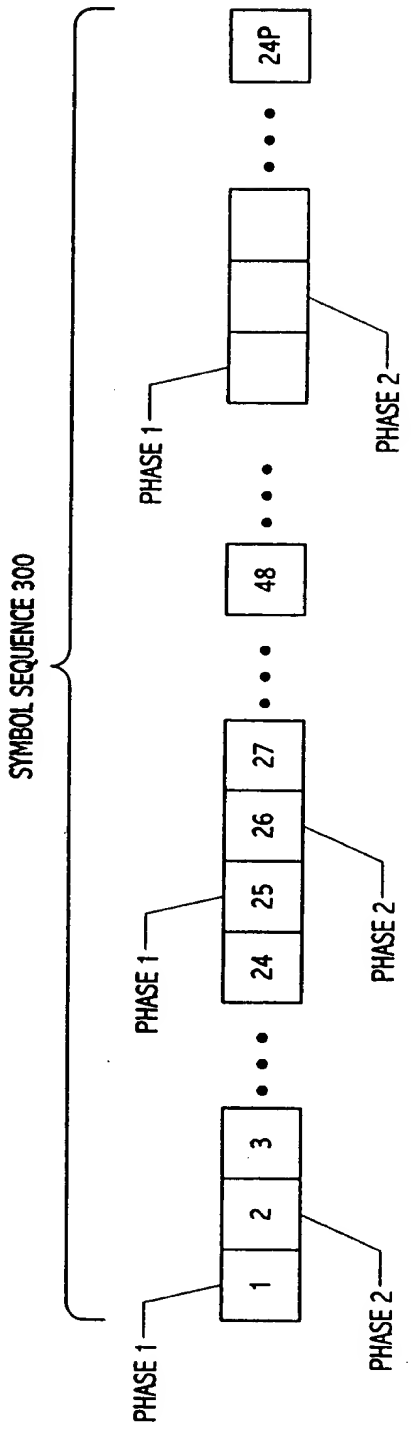

FIG. 3A

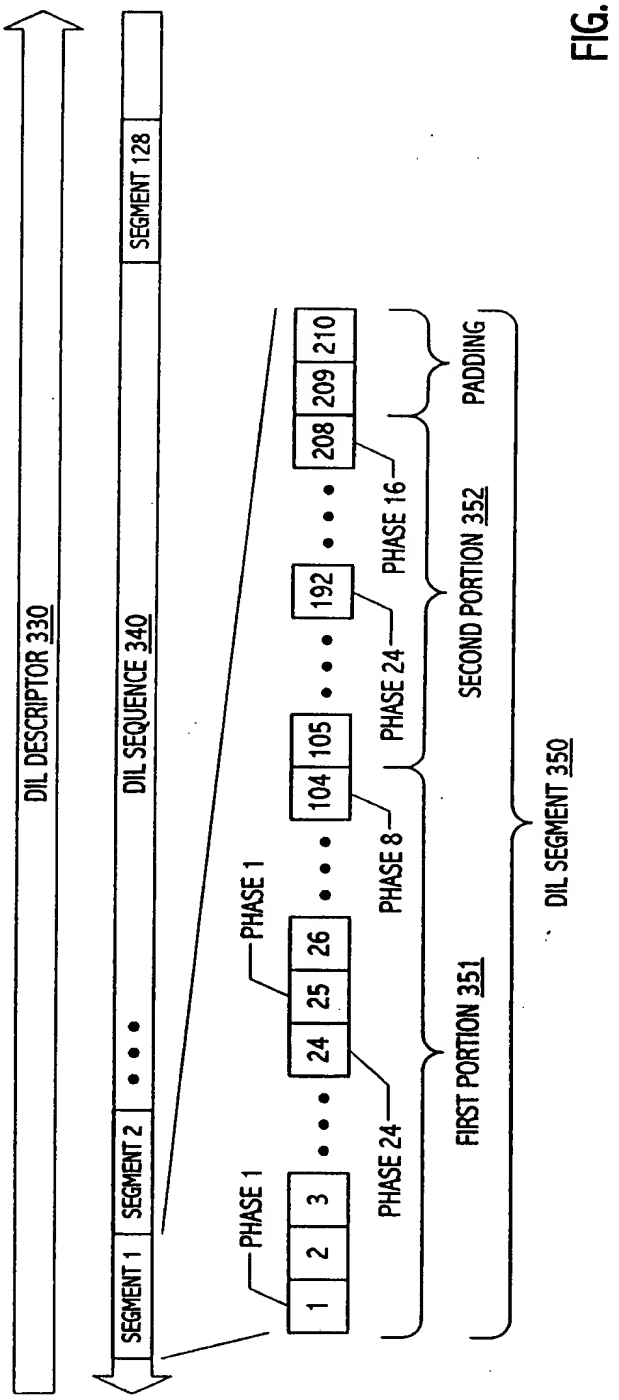

FIG. 3B

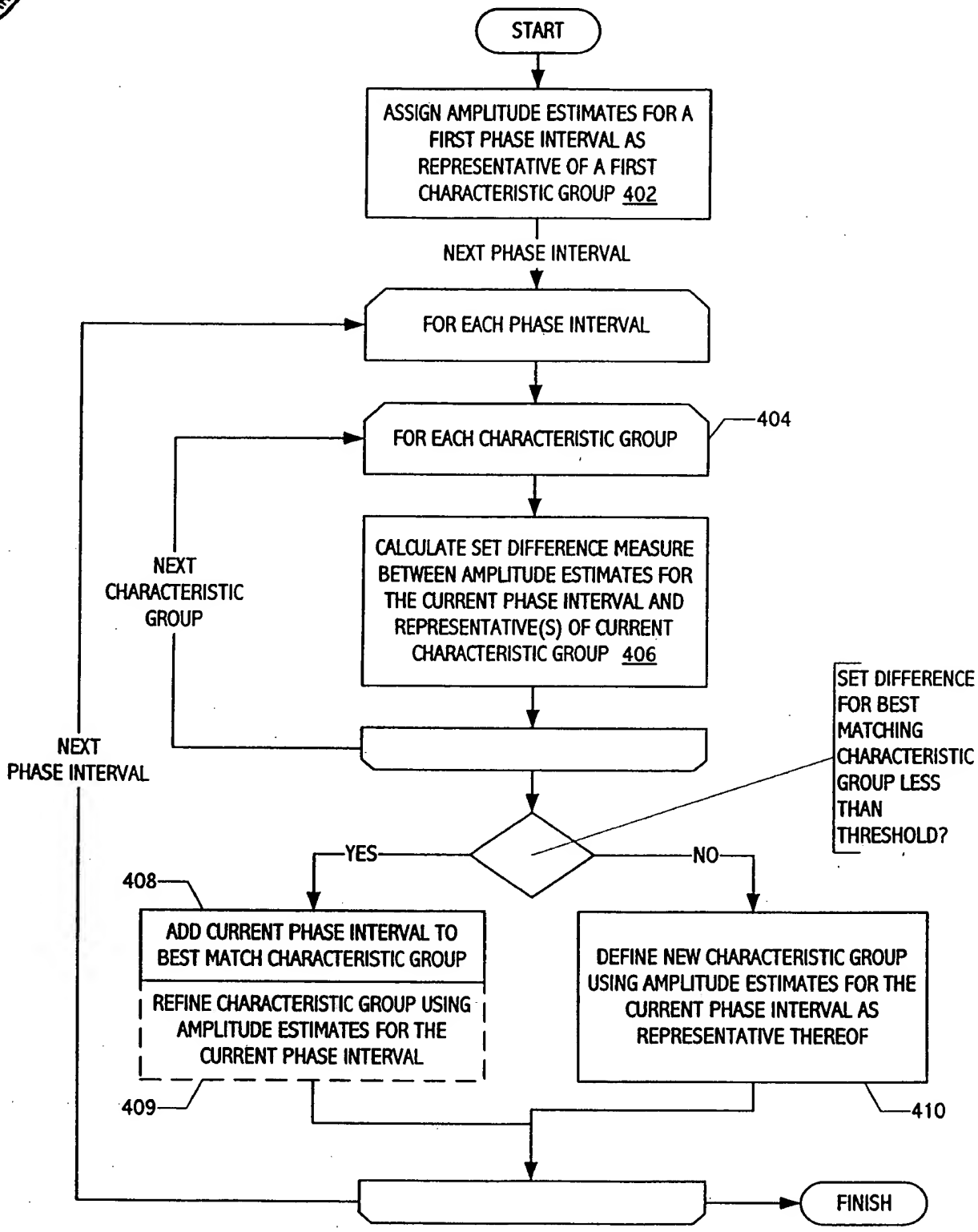

FIG. 4

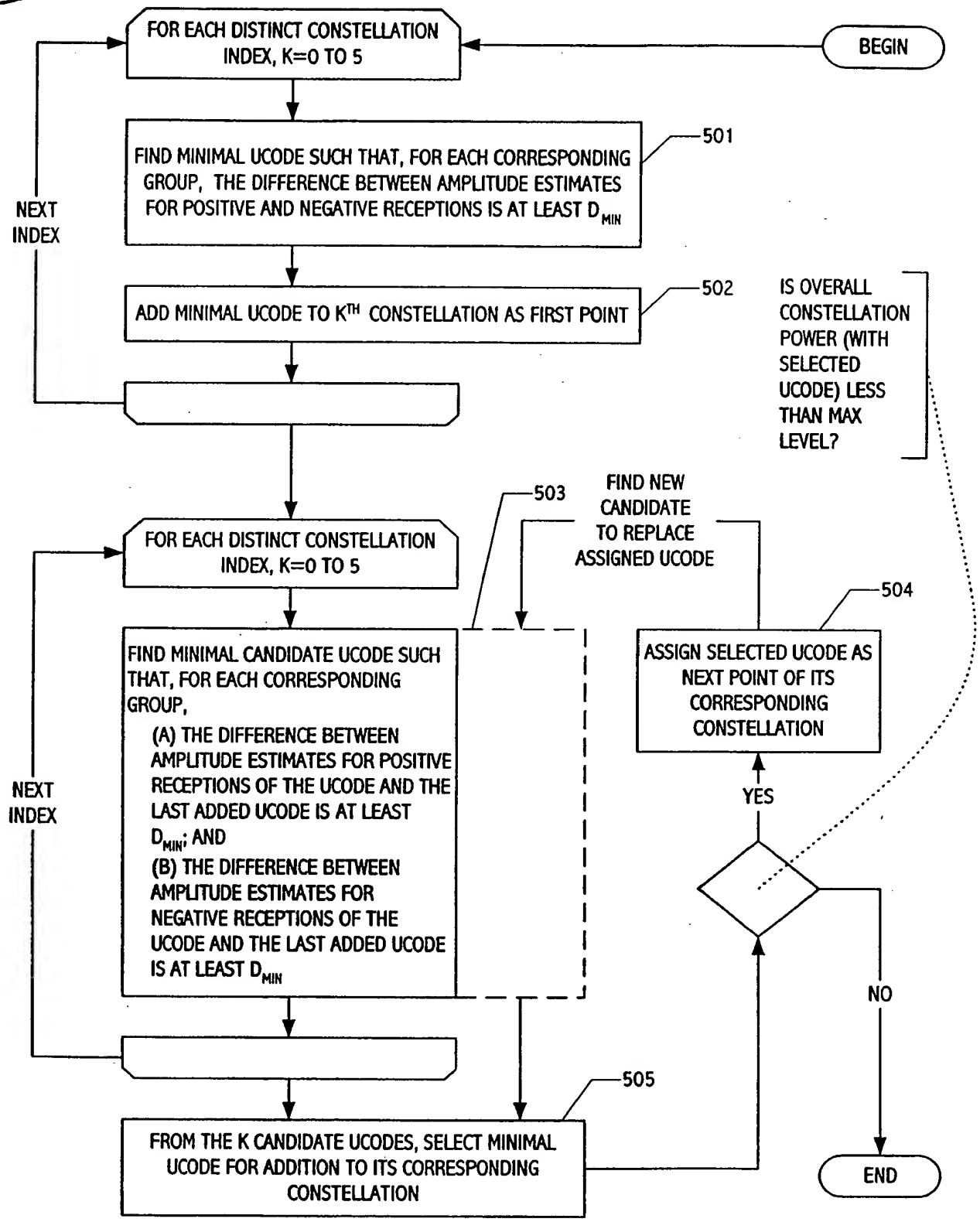

FIG. 5

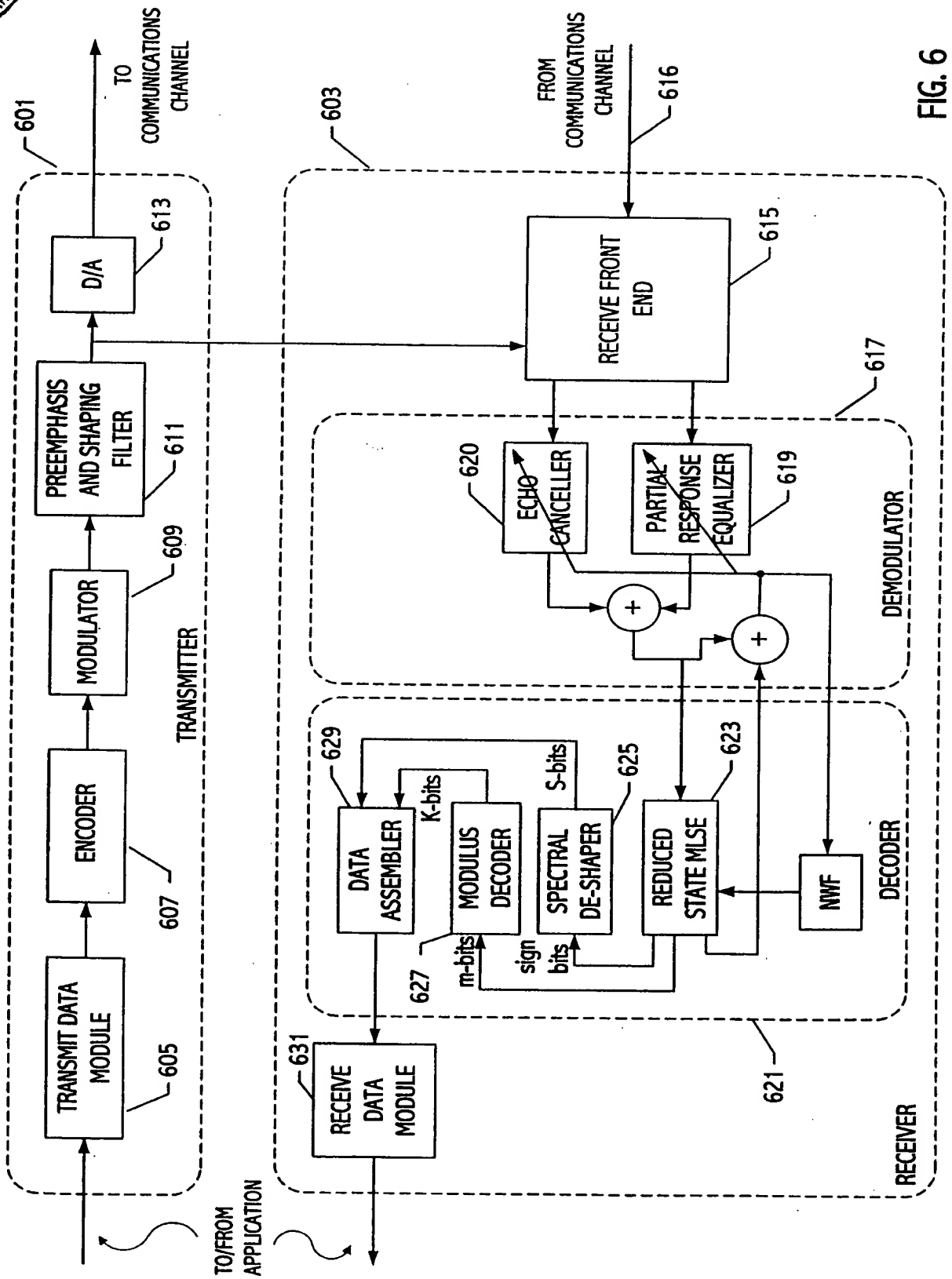

FIG. 6

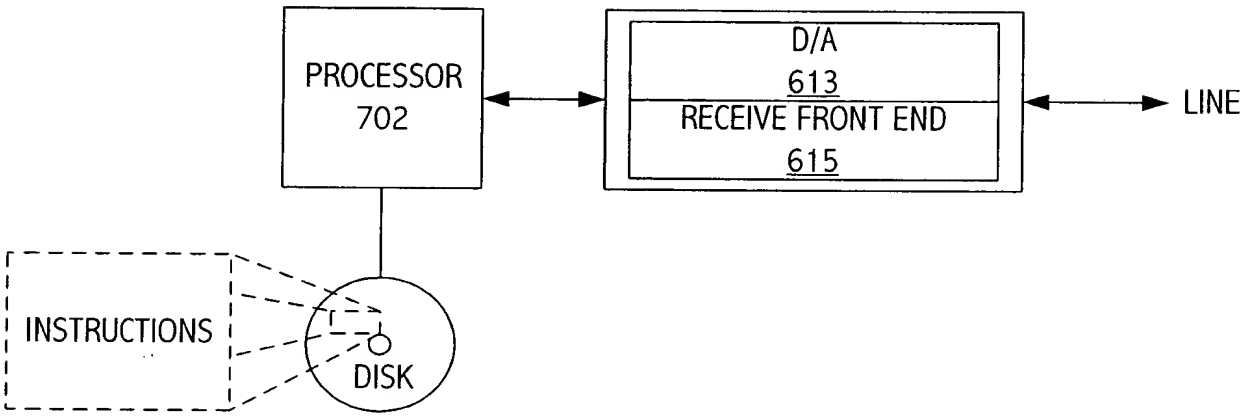

FIG. 7